



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,594	08/05/2003	Yoshiki Fujii	044499-0172	4806
22428 7590 01/07/2008 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			EXAMINER LE, BRIAN Q	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 01/07/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/633,594	FUJII ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Brian Q. Le	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 19-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

### **Response to Amendment and Arguments**

1. Applicant's amendment filed August 13, 2007, has been entered and made of record.
2. The rejection of claim 11 under 35 U.S.C. 112, first paragraph is withdrawn.
3. Applicant's arguments with regard to claims 1-20 have been fully considered, but are not considered persuasive because of the following reasons:

Regarding claim 1, the Applicant argues (pages 8-9 of the Remarks) that Nagasaki et al. does not teach a correction of inspection windows so as to appropriately correspond to the parts on a board to be inspect nor teaching a concept of the inspection window is adapted due to a design rule change for one or more of the parts mounted on the board. The Examiner respectfully disagrees. Nagasaki teaches a correction of inspection windows (FIG. 10 and FIGs. 25-26) so as to appropriately correspond to the parts on a board to be inspect (corresponding to the land) (column 3, lines 55-60 and column 20, lines 50-60) and teaches a concept of the inspection window (column 31, lines 33-54) is adapted due to a design rule change (correspond to individual land selection region) (column 31, lines 40-43) for one or more of the parts mounted on the board (regions of lands) (column 31, lines 10-20).

The Examiner believes that all the arguments of the Applicant have been properly addressed and explained. Thus, the rejections of all of the claims are maintained.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-8, 10-11, 13-16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagasaki et al. U.S. Patent No. 6,278,797.

Regarding claim 1, Nagasaki teaches a method of producing inspection data (method produces inspection information) (column 5, lines 10-13) for inspecting (column 1, lines 7-10) a parts-mounted board (land-attached circuit board) (column 15, line 17 and FIG. 1A) by image processing (column 23, lines 43-50), comprising:

reading inspection data corresponding to each part (prepare inspection data for each land for comparison) (column 3, line 55 to column 4, line 3) on a board (FIG. 1A) constituting an object of inspection from a parts library produced in advance (image of a land can be prepared in advance) (column 23, lines 49-51);

setting the inspection data at the mounting position of the part (land region fixing means to set/prepare mounting position data such as height of the lands for inspection) (column 5, lines 4-16 and column 23, lines 53-55);

detecting an image area corresponding to each land on an image picked up from a model of the board constituting the object of inspection (input images of the land object to compare with master image for inspection) (column 23, lines 43-65); and

based on the detection result (base on result to define whether the inspection if good or defective by a defined tolerance) (column 24, lines 20-53), automatically (the system is constructed to calculate the window on its own) (column 6, lines 50-55) correcting the set data

(concept of preparing a land size to reflect area or dimension of a land of a board) (column 3, lines 55-61) (column 7, lines 10-12 and FIG. 12A-FIG. 12B) for setting an inspection window (column 6, lines 50-57) included the read inspection data, when the inspection window is displaced with respect to the image area corresponding to each land (FIG. 43, P70; FIG. 47, P3003, P3005, P3006; FIG. 50; column 3, lines 55-61; column 4, lines 41-45; and column 6, lines 50-67 wherein the inspection window is set/defined/positioned in corresponding to each land of the image area), so that the inspection window is adapted for inspection of the board (to prepare for inspection area of the land of the board) (column 3, lines 55-61 and column 4, lines 4-41) (column 21, lines 4-25).

Wherein the inspection window (column 31, lines 33-54) is adapted due to a design rule change (correspond to individual land selection region) (column 31, lines 40-43) for one or more of the parts mounted on the board (regions of lands) (column 31, lines 10-20).

Regarding claim 2, Nagasaki also teaches an inspection data producing method (as discussed in claim 1) wherein the step of detecting the image area corresponding to said the land (column 23, lines 45-50), comprises:

retrieving the position of the land edges with reference (position data  $X_{ABS}$ ,  $Y_{INC}$  obtained for each scanning point of the surface of land would include the position of the land edges since the laser beam scans the entire surface of land) (column 4, lines 35-38; column 18, lines 46-49; column 19, lines 42-45 and FIG. 12B) to a solder (column 14, lines 33-40) inspection window (FIG. 12B) based on the set data before correction on the image of the model (base on inspection information before inspection and thus correction of image) (FIG. 25, S201).

Referring to claim 3, Nagasaki further teaches an inspection data producing method (as discussed in claim 1), wherein, in accordance with the correction of the set data (FIG. 5, element 94b and 94c and FIG. 25, S202, S203, S204) of the inspection window (FIG. 43, P10), inspection reference data corresponding to the corrected inspection window is corrected (FIG. 10 and column 21, lines 4-25).

Regarding claim 4, Nagasaki discloses an inspection data producing method (as disclosed in claim 1), wherein, using the corrected inspection data for a predetermined part (predetermined value/predetermined condition of part of each land for inspection purpose) (column 5, lines 7-8 and column 8, line 35) on the board (standard data as predetermined part on a land/board) (FIG. 9), the inspection data for the parts of the same type as the predetermined part is corrected (corrected/calculated the predetermined part/standard data/properties of land part) (FIG. 9; FIG. 19; column 24, lines 50-59 and column 26, lines 1-14).

For claim 5, Nagasaki also discloses an inspection data producing method (as discussed in claim 1), wherein the inspection data shared by the parts (standard data which are use for common inspection purpose of land such as land area, land diameter ...etc) (FIG. 9) is produced using the inspection data corrected for the same type of parts (corrected/calculated the standard/predetermined part/standard data/properties which are the same type of parts in inspecting land) (FIG. 9; FIG. 19; column 24, lines 50-59 and column 26, lines 1-14) on the board, and the inspection data for each part is rewritten (storing is writing in a memory, therefore for every time that storing is done after judgement, it is rewriting the data to the memory) into the common inspection data (storing standard inspecting data/same type of parts of land) (column 27, line 60 to column 28, line 8).

Referring to claim 6, Nagasaki further discloses an inspection data producing method (as discussed in claim 1), further comprising the step of:

rewriting the parts library or producing a new parts library (corrected data wherein producing new parameters for inspection if the standard inspection is not adequate for inspect processing) (FIG. 10; FIG. 25, S202, S203, S204) for a predetermined part using the corrected inspection data (column 21, lines 4-25 and column 31, lines 52-54).

Regarding claim 7, as discussed in claim 1 regarding the correction means based on the detection result, Nagasaki further teaches a board inspection apparatus (column 1, lines 7-12) comprising:

image input means (CCD camera) (column 34, line 17) for inputting an image picked up of a board (column 23, lines 43-47);

data file producing means (FIG. 19) for producing an inspection data file required for inspection of a board to be inspected (table of inspection data which is required for board/land inspection) (column 28, lines 10-15), by reading the inspection data corresponding to each part from a parts library (memory that stores inspection data commonly such as master image)(column 31, lines 48-52) and setting the inspection data on a mounting position of the part (land region fixing means to set/prepare mounting position data such as height of the lands for inspection) (column 5, lines 4-16 and column 23, lines 53-55);

land inspection means for receiving an input model image of a corresponding board (the process of retrieving master image) (column 23, lines 50-65) after complete production of the inspection data file and detecting an image area corresponding to a land on the image (after the

generation of standard data of master image of each corresponding land) (column 3, lines 55 to column 4, line 3; column 4, lines 23-37; and column 23, lines 43-50); and

registration means for registering in a memory (storing data to a memory) (column 19, lines 24-30) the inspection data file including the corrected set data (store corrected data) (column 19, lines 24-26).

Regarding claim 8, Nagasaki teaches a board inspecting apparatus wherein the memory corresponds to the parts library (FIG. 19 and column 19, lines 24-32).

For claim 10, Nagasaki teaches a board inspecting apparatus wherein, when the inspection window has been corrected using an image of the board in which no parts are mounted thereon (correct using master image on the existing regions of land) (column 4, lines 21-41 and column 23, lines 43-67),

The image input means images a second board on which parts are mounted thereon (processing image of each land would include image input a second board/picture elements which parts are mounted) (column 21, lines 15-25),

Wherein, based on the imaging the second model of the board, the registration means only registers the inspection data file after making a determination that the corrected inspection data is proper (The process of checking whether the coordinates, geometric center of gravity or area is proper to a certain threshold value) (column 22, lines 46-67).

For claim 11, Nagasaki also teaches a board inspecting apparatus wherein the inspection window is corrected using the image picked up from the model of the board on which no parts have been mounted (correct using master image on the existing regions of land) (column 4, lines



21-41 and column 23, lines 43-67) (reference image/master image would have no parts mounted since it is an already existed image at column 4, lines 42-60 and column 14, line 50).

For claims 13-14, please refer back to claims 10-11 respectively for further teachings and explanations.

Regarding claims 15-16, Nagasaki teaches an inspection data producing method wherein the inspection data is automatically corrected (calculation by the system) when the image area corresponds to each land on the model of the board has been either increased or decreased with respect to the read inspection data (column 23, lines 43-67) (FIG. 25, S204; column 28, line 67 and column 31, lines 32-57).

Regarding claim 18, Nagasaki further teaches an inspection data producing method (as discussed in claim 1) wherein the inspection window includes a first inspection window that encompasses the part itself (FIG. 50), a second inspection widow that encompasses solder regions used to mount the part on the board (land region also include solder region) (column 3, lines 40-50, and a third inspection window that encompasses land regions where the part is mounted on the board (Marker M2 corresponds to individual land selection region) (column 31, lines 40-42), and a reference inspection window (master image) (FIG. 53A) for the part that encompasses regions covered by the first, second and third inspection windows.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaki et al. U.S. Patent No. 6,278,797.

Regarding claim 9, Nagasaki teaches a board inspecting apparatus (as discussed in claim 7) wherein the inspection data includes luminance (reflectance) and brightness values of color light shined on the part on mounted on the board (column 3, lines 17-38). Nagasaki does not explicitly teach that color light can be Red, Green and Blue. The Examiner take an Office Notice that it is obvious for color light to be described in an well known color system such as Red, Green, and Blue (RGB) color system. Thus it would have been obvious for one skilled in the art to use RGB color system as a modification to Nagasaki to describe luminance and brightness values of color light shined on the part when mounted on the board.

For claim 12, please refer back to claim 9 for further teachings and explanations.

Regarding claim 17, as discussed in claim 9 regarding RGB colors, Nagasaki further teaches a board inspecting apparatus (as discussed in claim 7) wherein the inspection data file comprises:

binary threshold values (column 30, lines 31-40) used for extracting the set position and size of inspection window for each part mounted on the board (using binary threshold to determine land existing region or background surface) (column 23, lines 30-35).

Color patterns with respect to the inspection window for each part mounted on the board (column 31, line 55 to column 32, line 5); and

An inspection program used for the inspection window for each part mounted on the board (column 19, lines 10-20).

*Allowable Subject Matter*

8. Claims 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

**Contact Information**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Q. Le whose telephone number is 571-272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Brian Le  
Primary Examiner  
January 3, 2008